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THE UNIVERSITY OF MINNESOTA

BULLETIN

Vol. 2. APRIL 15, 1899. No. 5

TABLE OF CONTENTS.

The Department of Agriculture:

College of Agriculture,
School of Agriculture,
Dairy School,
Experimental Station,
Students.

The University Bulletins are issued every six weeks, during the University year, at least six numbers every calendar year. Entered at the Postoffice in Minneapolis as second-class mail matter

MINNEAPOLIS, MINN.

The University Bulletins are published by authority of the Board of Regents, six times a year,—every six weeks during the University year. Bulletins will be sent gratuitously, postage paid, to all persons who apply for them. In calling for bulletins, please state department of the University concerning which you desire information. Address

THE REGISTRAR,
The University of Minnesota,
Minneapolis, Minn.

The University

THE UNIVERSITY OF MINNESOTA comprises the following named colleges, schools and departments:

THE GRADUATE DEPARTMENT.
THE COLLEGE OF SCIENCE, LITERATURE AND THE ARTS.
    The School of Technical and Applied Chemistry.
THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS.
THE SCHOOL OF MINES.
THE COLLEGE OF AGRICULTURE.
    The School of Agriculture.
    The Dairy School.
THE COLLEGE OF LAW.
THE DEPARTMENT OF MEDICINE, composed of colleges as follows:
    The College of Medicine and Surgery.
    The College of Homeopathic Medicine and Surgery.
    The College of Dentistry.
    The College of Pharmacy.
The Regents of the University have also entrusted to their charge
    THE EXPERIMENT STATION;
    THE GEOLOGICAL AND NATURAL HISTORY SURVEY.

THE GRADUATE DEPARTMENT. In each of the colleges, except that of Medicine, there are advanced courses of study leading to second degrees. These courses are open to graduates of any reputable college upon presentation of diploma.

In the COLLEGE OF SCIENCE, LITERATURE AND THE ARTS there are four four-year courses of study, the classical, scientific, literary and civic. The classical course offers for its leading studies the Greek and Latin languages; the scientific course, the natural and physical sciences; the literary course, the modern languages; the civic course, history and philosophy. The completion of the courses leads respectively to the degrees: bachelor of arts, bachelor of science, bachelor of literature, and bachelor of philosophy. The advanced degrees offered in this college are: master of arts, science, literature and philosophy, and doctor of philosophy.

The School of Technical and Applied Chemistry, leading to the degree of bachelor of science, is also organized as a part of this college.

A Summer School for Teachers. A four weeks' course of instruction is offered, in various University subjects, for those whose school duties prevent them from taking the regular University courses.

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS offers courses of study, of four years each, in civil, mechanical and electrical engineering; leading to the degrees of civil, mechanical and electrical engineer. This college also offers graduate work leading to the degree master of science.

THE SCHOOL OF MINES offers a four years' course of study in mining and metallurgy; upon the completion of which the degrees engineer of mines, and metallurgical engineer are conferred.

THE COLLEGE OF AGRICULTURE offers a regular course in agriculture of four years of college work; the degree of bachelor of agriculture is conferred on completion of the course.

THE SCHOOL OF AGRICULTURE is open to both men and women, and is a training school for practical farm life and in domestic economy. The college of agriculture is open to graduates of this school.

A Dairy School offers practical instruction in dairying to those who have had some experience in conducting a dairy.

THE COLLEGE OF LAW offers a three years' course of instruction, leading to the degree of bachelor of laws. There is an evening class in this college leading to the same degree. This college offers graduate work leading to the degrees, master of laws, and doctor of civil laws.

THE COLLEGE OF MEDICINE AND SURGERY and THE COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY each offers a four years' course of study, of eight months each; upon completion of the prescribed course the degree of doctor of medicine is conferred.

THE COLLEGE OF DENTISTRY offers a three years' course of study of nine months each; upon completion of the prescribed course the degree of doctor of dental medicine is conferred.

THE COLLEGE OF PHARMACY offers a two or three years' course of study, leading to the degree of pharmaceutical chemist. This college also offers graduate work leading to the degrees, master of pharmacy, and doctor of pharmacy.

SPECIAL COURSES. In each of the colleges, students, of an advanced age and adequate preparation, are permitted to pursue, under the direction of the faculty, one or two distinct lines of study.

Catalogues of any department sent free to any address, upon application. The full catalogue will be sent only upon receipt of ten cents to cover postage. Address,

THE REGISTRAR,
University of Minnesota,
Minneapolis, Minn.

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(St. Anthony Falls Bank.)

Calendar, 1899-1900.

OCTOBER	2,	1899	—Entrance examinations and registration.
"	3,	"	—Entrance examinations and registration.
"			Chapel at 4 p. m. Regular classes begin.
"	9,	"	—Literary and class societies meet.
"	17,	"	—Home dairying begins.
"	28,	"	—Examinations.
NOVEMBER	25,	"	—Examinations.
"	30,	"	—Thanksgiving Day; no classes.
DECEMBER	22,	"	—Term examinations.
"	23,	"	—Holiday recess begins.
JANUARY	2,	1900	—Entrance and condition examinations.
"	3,	"	—Classes called; work resumed at 8:15 a. m.
"	10,	"	—Home dairying begins.
"	27,	"	—Examinations.
FEBRUARY	22,	"	—Washington's Birthday; no classes.
"	24,	"	—Examinations.
MARCH	20,	"	—Term examinations.
"	21,	"	—Term examinations.
			—Alumni re-union.
"	23,	"	—Commencement Day. Eleventh annual Commencement.
"	24,	"	—Summer vacation begins.

STANDING COMMITTEES.

Examinations and Registration: Robertson, Drew, W. Boss, Mahood, Mrs. Meredith, Keyes.

Library: Hays, Brewster, Reynolds.

Absence and Tardiness: Mahood, Reynolds, Snyder.

Military Drill: Green, Hæcker, Leonhæuser.

Catalogue: Lugger, Aldrich, A. Boss, Vye.

Entertainment. Robertson, Mrs. Meredith, Vye, Shaw.

The College of Agriculture.

THE FACULTY.

CYRUS NORTHROP, LL. D., *President.*
WILLIAM M. LIGGETT, *Dean.*
SAMUEL B. GREEN, B. S., *Professor of Horticulture and Forestry.*
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T. L. HAECKER, *Professor of Dairy Husbandry.*
M. H. REYNOLDS, M. D., V. M., *Professor of Veterinary Medicine and Surgery.*
WILLET M. HAYS, M. Agr., *Professor of Agriculture.*
THOMAS SHAW, *Professor of Animal Husbandry.*

NOTE—The instruction not given by the faculty of the college of agriculture is given by the faculty of the college of science, literature and the arts.

PURPOSE AND SCOPE.

The college course in agriculture is a thoroughly scientific course emphasizing the sciences of botany, chemistry, physics and zoology, and requiring during the freshman and sophomore years at least two terms' work in each.

The course naturally divides itself into two parts of two years each, the first part giving but little opportunity for the election of studies, and the latter part making all studies elective. Twelve terms of scientific work are required, in chemistry, physics, botany and zoology, during the freshman and sophomore years. A student may elect a six term course in either botany or zoology, or a three term course in each. In chemistry and physics the student takes a four term course in either, and a two term course in the other.

The technical agricultural subjects follow in the junior and senior years, throughout which the student elects as a specialty either one of his major sciences in some of its different forms or some technical agricultural subject with reference to which specialty all other studies are elected.

No classics are required, for the reason that the three modern languages, German, French and Scandinavian, are of more value to the student of scientific agriculture.

The elective studies in the last two years of the course give opportunity for liberal culture in art, literature and philosophy, and for becoming proficient in scientific research work in some of the many problems pressing for solution in the development of the state and national agricultural experiment stations.

REQUIREMENTS FOR ADMISSION.

Candidates for admission to the freshman class are required to show attainment equal to that represented by the certificate of graduation from the School of Agriculture. Graduates of the School of Agriculture who have completed the studies required for entrance to this college are admitted on presentation of their certificates; after 1901, all graduates before admission to this college are also required to present with their certificates testimonials showing that they have completed the fourth year's work as required in the School of Agriculture. Graduates from high schools may be admitted to the freshman class after spending a year in the School of Agriculture, pursuing such studies as the faculty may require. Before graduation, however, all of the required work in the School of Agriculture must be completed.

REQUIREMENTS FOR GRADUATION.

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work, students will be recommended for graduation with the degree of bachelor of agriculture.

COURSE OF STUDY.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Solid Geometry, 4.	Trigonometry, 4.	Chemistry, 4.
German, 4.	German, 4.	German, 4.
Drawing, 4.	Drawing, 4.	Rhetoric, 4.
Botany or Zoology, 4.	Botany or Zoology, 4.	Botany or Zoology, 4.
Military Drill, 2.	Military Drill, 2.	Military Drill, 2.

SOPHOMORE YEAR.

Physics, 4.	Physics, 4.	Physics or Geology, 4.
Chemistry, 4.	Chemistry, 4.	Chemistry, 4.
Botany or Zoology, 4.	Botany or Zoology, 4.	Botany or Zoology, 4.
German, 4.	German, 4.	German, 4.
Military Drill, 2.	Military Drill, 2.	Military Drill, 2.
Rhetorical Work, 1.	Rhetorical Work, 1.	Rhetorical Work, 1.

JUNIOR YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Breeding Crops, 4.	Veterinary Science, 4.	Horticulture, 4.
Veterinary Science, 4.	Agricultural Chemistry, 4.	Animal Feeding, 4.
Agricultural Chemistry, 4.	Farm Dairying, 2.	Agricultural Chemistry, 4.
Dairy Stock, 4.	Dairy Feeding, 2.	Veterinary Science, 4.
Forestry, 4.		Field Crops and Seeds, 4.
Entomology, 4.		Dairy Feeding, 2.
Animal Breeding, 4.		

SENIOR YEAR.

Agricultural Engineering, 4.	Farm Economics, 4.	Entomology, 4.
Horticulture, 4.	Dairy Factory Course, 4.	Forestry, 4.
Agricultural Chemistry, 4.	Agricultural Chemistry, 4.	Veterinary Science, 4.
	Veterinary Science, 4.	

In the junior and senior years students are required to elect twelve of the above subjects. They are also required to elect an equivalent amount of work from the following list given in the college of science, literature and arts; animal biology, physics, botany, mathematics, English, English literature, geology, mineralogy, political economy, history, astronomy, pedagogy, psychology, history of philosophy, social philosophy, French, German, Scandinavian. The elective work is subject to the approval of the faculty. Students are advised to continue at least one of the lines of work offered, through the junior and senior years.

COURSES OF INSTRUCTION.

AGRICULTURE.

A portion of the work in agriculture is in the form of lectures. The writing of papers on special subjects is made a feature. Research work is arranged for in many cases, and practice work on the farm and in the laboratory is provided. The courses of study are arranged for at such times of the year as will best suit the students in the department. The aim is to have students get experience in field agriculture, both practical and experimental and in demonstration instruction. The work is a continuation of the agricultural studies in the school of agriculture, each subject being here treated from the more technical standpoint.

Course I. Field crops and seeds.

In this course are considered the botany, cultivation place in the rotation and the utilization of the various cereal, forage, root, fiber, sugar, and miscellaneous crops. Special attention is given to the subjects of permanent, rotation, annual, and shift pastures; to permanent and rotation meadows, and to the production of all kinds of dry-cured and ensilaged forage.

Course II. Crop breeding.

Heredity, variation, extensive selection; field crop nursery management; producing new qualities by crossing and by change of environment; outcrossing versus inbreeding and self fertilization; originating varieties and improving standard varieties; choice of foundation stocks, methods of selecting, crossing followed by selection; increasing newly originated stocks; testing new kinds by comparing them with standard varieties; methods of disseminating new varieties.

Course III. Agricultural Engineering.

Selecting farms, deciding upon systems of farming, planning farms, subduing new soils, farm buildings, fences, roads, tillage, irrigation, implements and machinery.

Course IV. Farm economics.

Field management, rotation, weeds, labor, prices, purchases and sales, farm finances, the permanent farm investment, agricultural pedagogics.

Additional courses in special lines may be arranged for upon application.

The University experiment farm consisting of two hundred and fifty acres of valuable land, is located between St. Paul and Minneapolis three miles from the campus of the University, and adjoins the state fair grounds. It contains a large variety of soils and exposures and is well adapted to the work of the experiment station and the instruction in agriculture. The farm buildings and the fields are well arranged for experiments and instruction in the various technical agricultural subjects.

AGRICULTURAL CHEMISTRY.

Either two or four terms of chemistry are required, and after completing this required work any of the special courses in agricultural chemistry may be elected.

Course I.

In the spring term of the freshman year the subject of general chemistry is pursued. This work is a continuation of the first term's work in chemistry, as given in the school of agriculture. The work consists of lectures and recitations. Remsen's advanced course in chemistry is used as a text-book. Particular attention is given to the study of those elements and compounds which are of the most importance in agriculture.

Course II.

In the fall term of the sophomore year the student begins the subject of qualitative analysis. This course is arranged to meet the special wants of agricultural students and is completed the second term of this year. The qualitative analysis of insoluble substances is emphasized. The student spends three two hour periods each week in the laboratory, and one period is devoted to a lecture and a recitation. The students are required to write all of the chemical reactions, and to explain the separations involved.

Course III.

In the spring term of the sophomore year an elementary course in quantitative analysis is given. This work includes the gravimetric determination of iron, the determination of iron by the bichromate method, the determination of sulphuric anhydrid acidimetry, alkalimetry, the determination of phosphoric anhydrid, and of calcium oxide.

Course IV. The chemistry of farm products.

Lectures, one term, 4 hours per week. (Given in 1900-1.)

This course relates to the chemistry of production and use of farm products. The ash elements, their importance and functions, and the extent to which they are present in agricultural plants; the organic compounds, found in plants and animals, their functions and uses for food purposes; the chemistry of fermentation, germination, and the factors which influence the growth and composition of farm crops; the composition of human food stuffs, and special topics relating to the chemistry and economy of human foods; and the chemistry of animal nutrition are some of the more important topics which are considered.

Course V. The chemistry of soils and fertilizers.

Lectures, one term, 4 hours. (Given in 1900-1.)

This course consists of lectures treating of the various sources of plant food, the forms of food which are the most valuable to growing crops, the amount of food which crops require, and the power which crops possess for obtaining their food from the soil. The subject of soil exhaustion and soil improvement is the basis of this terms work. The size of the soil particles, and their relation to crop production, the composition and characteristics of farm manures, and commercial fertilizers, the subject of nitrification and the laws which govern the increase and decrease of the soil nitrogen, the organic compounds of the soil and the part which they take in soil fertility are some of the topics which are studied.

Course VI. The analysis of agricultural products.

The course consists mainly of laboratory practice, and includes the separation and determination of the various compounds found in plants and animals. Ample facilities are offered in the practical lines of this work inasmuch as numerous chemical analyses are always in progress in the experiment station laboratory. The work includes the analysis of milk, butter, cheese, fodders, grains, milled products, roots, and tubers, including sugar-beets. The work begins with the determination of the nitrogen, and includes the pentosans, starches, fats and other organic compounds. After making these various determinations the student is required to make a complete proximate analysis of some food material. The adulteration of agricultural products, and the methods employed to detect adulteration forms a prominent part of the work. The analysis of water for household, stock, and irrigation purposes is taken up. This course extends through three terms, 4 laboratory periods per week, and is open to all students who have completed the required work in quantitative analysis.

Course VII. The analysis of soils and fertilizers.

This course extends through two terms, and includes the study of the methods employed in soil investigations. The chemical analysis of soils and the separation and determination of the various sized soil particles, as sand, fine sand, silt, fine silt, and clay form an important part of the work. Practice is also given in the methods of fertilizer analysis.

Courses VI and VII are intended for those students who wish to make a specialty of agricultural chemistry.

ANIMAL HUSBANDRY.

Course I. Animal breeding.

Under this head lectures are given on the laws which govern breeding. The principles are considered upon which a standard of excellence is based and various standards are compared. Heredity in its various features is discussed, not only with reference to characteristics that are normal, but also with reference to those that are abnormal and acquired. Careful consideration is given to the heredity of diseases. The law of correlation is dwelt upon. Prepotency is discussed especially from the standpoint of practical utility. The good and evil that may result from in-and-in-breeding and line breeding are pointed out. Fecundity and the influences which affect it are examined. The relative influence of parents, the influence of a previous impregnation, intra-uterine influences and those that affect the determination of sex are discussed. The many and far-reaching influences of nutrition are dwelt upon and quality in live stock, the coat and influences which affect it, and the out-come of artificial conditions generally are gone over with much care. Early maturity, pedigree and animal form as an index of qualities are defined and their great practical value is shown. The art of selection receives special attention. Cross-breeding, grading, the formation of breeds, and the influences of environment are carefully examined.

Course II. Feeding animals.

The question of feeding is considered from both the scientific and the practical standpoints. The foundation for succeeding lectures is laid by first considering some important principles which govern feeding. Feeding rations and nutritive ratios are next discussed and these are followed by lectures on feeding stuffs and the different methods of preparing foods for feeding. Then follows the feeding and management of cattle treated chiefly from the practical standpoint. Lectures are given on rearing calves during the milk period and store animals from the weaning to the finishing period; on finishing for the block on grass, also in the stall; on the selection and care of both males and females of the best breeds, and on stabling suitable for cattle. Similarly the feeding and management of sheep and swine are considered. Careful attention is given to the discussion of wool and its properties and to sheep for wool production, for mutton production, and for both uses combined.

Course III. Pasturing live stock.

Lectures are given with reference to the prodection of pasture other than grass suitable for the various classes of domestic animals kept on the farm. The most approved methods of pasturing these are also discussed. In these lectures every opportunity available is embraced of illustration by direct reference to living animals and an examination of the various kinds of food more commonly used in feeding them.

DAIRY HUSBANDRY.

Course I. Dairy stock and dairy farm management.

Lectures, one term, three hours per week. Practice work, one term, one hour per week.

This course is given during the fall term of the junior year. The lectures cover the breeding, rearing, and management of dairy stock, the points and characteristics essential in animals intended for the dairy, practice work in judging dairy stock, the management of the dairy farm.

Course II. Dairy feeding. Lectures, two terms, two hours per week.

This course consists of lectures covering both the scientific and practical questions underlying the principles of feeding. Practice work is given in compounding rations, estimating comparative value of food stuffs and other problems connected with the subject. (Given in years, beginning with even numbers.)

Course III. Farm dairying. Lectures and practice work, one term, two hours per week.

In this course the student receives lectures on milk, its care, the various methods of creaming it, care of the cream, and the manufacture of butter, and sweet curd cheese. A student taking this course devotes the greater portion of his time to practice work in the "Farm Dairy Room." (Given in years, beginning with odd numbers. One-half credit.)

Course IV. Factory course in butter and cheese.

This course is offered in January of each year. The work comprises two lectures a day, one in butter and one in cheese, and practice work two afternoons a week in butter-making and two afternoons in cheese making. Any student may take either part of this course and obtain a half credit.

Course V. Dairy laboratory work.

The work in this course will not be offered during the year 1899-1900.

ENTOMOLOGY.

The study of entomology will be of a practical nature and only sufficient work will be given in dissecting and classifying insects to enable the students to recognize them as being useful, injurious or indifferent to agriculture and horticulture. The various artificial remedies and insectides, known to be of benefit will be discussed, as well as natural remedies based upon the life-history of the insects. Injurious and beneficial insects found in Minnesota will be considered, with a view of fighting the former and protecting the latter. The relationship existing between insects and man, between insects and insects, and between insects and plants will be studied in detail. Students wishing to make a special study of economic entomology can find work in the laboratory during the summer, providing they show aptitude for such work and already possess the preliminary training.

HORTICULTURE.

Course I. Fruit growing.

Lectures one term. The study of the geography of fruit growing, outlook for fruit growing, planting, tilling and fertilizing of fruit lands; diseases and insects injurious to fruits, spraying; harvesting and marketing of fruit; varieties of fruits.

Course II. Vegetable growing.

Lectures one term. Geography of vegetable growing, tilling and fertilizing vegetable lands; irrigation and rotation of crops; seed growing and seed testing; vegetables under glass, pollination; diseases and insects injurious to vegetables and their prevention; harvesting and marketing; varieties of vegetables.

Course III. Greenhouses and their management.

Lectures and laboratory work; greenhouse instruction and management; temperature, soil, watering, benches; propagation by seeds, cuttings, layers and graftage; diseases and insects injurious to vegetables and their prevention; rest and growth periods of plants; plants for greenhouse cultivation.

Course IV. Nursery work.

Lectures and laboratory work. Seedage; layerage; cuttage; graftage; planting; pruning; thinning; storage of nursery stock; tillage of nursery lands; insects, diseases injurious to the nurseries and their prevention.

Course V. Plant breeding.

Lectures and laboratory work. The fact and philosophy of variation; crossing of plants; origination of domestic varieties.

FORESTRY.

Course I. Lectures.

The forestry situation in this country and its literature; lumbering in Minnesota; forest influences; forest supplies; forest management; prairie forestry.

Course II. Lectures and field work.

Characteristics of forest and ornamental trees that are hardy in Minnesota; their value for timber and other purposes and methods of propagation.

MATHEMATICS.

Mathematics, as pursued in the college of agriculture, aims primarily at mental discipline and only secondarily at application to lines of practical work.

Geometry, as a discipline for clear perception, accurate statement and logical reference is required, both plane and solid.

Trigonometry is required, both as a mental discipline and for application to practical work in surveying.

VETERINARY MEDICINE AND SURGERY.

The work in this department extends over three terms in the junior year and one term in the senior year. Instruction is given by text-book, lectures, collateral reading and by clinical work in the hospital. The lectures are illustrated by means of skeletons, manikins, charts and by the living animal in actual practice. Anatomy of the digestive organs and the higher physiology of digestion are given prominence in this work.

Theory and practice of medicine are carried further than in the school of agriculture course. Infectious diseases of domestic animals are studied with special reference to causes, recognition, prevention and methods of control. Certain medicines which the intelligent stockman should understand are studied with reference to uses, doses and methods of administration.

Course I.

This is a continuation of the last term's work in the school of agriculture and includes an advanced study of the veterinary physiology of digestion, taking up the digestive fluids; digestion of grains and fodders; absorbtion in general and nervous mechanism of digestion. It also includes a study of body nutrition, body incomes and expenditures, including sources of heat supply and heat loss, and metabolism.

Course II.

The muscular system, including general results of contraction, muscle currents, muscle fatigue and laws of muscular work.

The nervous system, including irritability of nerves, electric phenomena of nerves, reflex action, cranial nerves and sympathetic nervous system.

This course also includes the physiology of the skin and nitrogen excreting apparatus, and a study of the locomotor apparatus, including shoeing, diagnosis and and treatment of common forms of lameness.

Veterinary Physiology by F. Smith is used as text book and guide for this work in courses one and two; but students are required to do collateral reading and original investigation.

Course III.

This course includes symtoms and recognition of common diseases, common medicines in their doses, uses, dangers and methods of administration. During this course Veterinary Therapeutics and Pharmacology by Wallace Hoare and Veterinary Medicines by Finlay Dunn are used as text-books and guides.

Course IV.

This course includes a study of common diseases of farm stock, as to causes, prevention, diagnosis and treatment.

EQUIPMENT.

LIBRARY.

The library of the college of agriculture contains about four thousand bound volumes, and nearly four thousand pamphlets. The separate libraries of the school of agriculture, experiment station and college of agriculture have all been consolidated, and the consolidated library now forms a part of the general University library, though located at University Farm. The reports of the various State Boards of Agriculture, and Experiment Stations are all kept on file, as well as many of the more important periodicals relating to agriculture. The library is being equipped with the view of making it a reference library for agricultural work. A complete file of some of the more important foreign agricultural periodicals as Versuchs-Statione, Biedermann's Centralblatt, Annales d l'Societe agronomique, and the Journal of the Royal Agricultural Society of England.

MUSEUM.

The general museum is at present chiefly an agricultural one, containing collections of animals and plants arranged in such a manner as to show their economic relations to the farmer and fruit grower. It is rapidly growing and of great value to the students. The entomological collections of the museum, and Dr. Lugger's private collections, are very valuable and contain a very large number of insects of all orders, and all are available for the use of advanced students.

The School of Agriculture.

FACULTY.

Cyrus Northrop, LL. D., *President.*
William M. Liggett, *Dean.*
Henry Webb Brewster, Ph. D., Principal, *Mathematics.*
Samuel B. Green, B. S., *Horticulture, Forestry.*
Otto Lugger, Ph. D., *Zoology, Entomology.*
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William Robertson, B. S., *Physics, Botany.*
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Harry Snyder, B. S., *Chemistry.*
T. L. Haecker, *Dairy Husbandry.*
M. H. Reynolds, M. D., V. M., *Physiology, Veterinary Science.*
Willet M. Hays, M. S., *Agriculture.*
Thomas Shaw, *Animal Industry.*
J. M. Drew, *Blacksmithing, Poultry.*
Andrew Boss, *Dressing and Curing Meats, Farm Machinery.*
William Boss, *Carpentry, Power Machinery.*
Harry A. Leonhaeuser, Lieutenant U. S. A., *Military Drill.*
E. W. Mahood, M. A., *Arithmetic, Civics, English and Director of Gymnasium.*
Juniata L. Shepperd, M. A., *Cooking. Laundering.*
Margaret Blair, *Sewing.*
Virginia C. Meredith, *Preceptress.*
Chas. F. Keyes, A. B., *Language and Music.*
Louise Gilman Kiehle, *Physical Culture.*

When applying for admission or information, address Dr. Henry W. Brewster, Principal, St. Anthony Park, Minn.

OPENING.

The coming year will open October 2d, 1899, and close March 23, 1900. The fall term closes Friday, December 22d, and the winter term begins Tuesday, January 2d, giving a vacation of ten days. Owing to the shortness of the school year, it is very desirable that students be on hand the first day of the term, that registration may be completed and work begun promptly. Students registered in the fall term will not be received after the first three days of the winter term, unless they shall present a reason able excuse for such delay.

ADMISSION.

Applicants who have completed a common school course in English grammar, arithmetic, history of the United States and geography, as prescribed by the state department of public instruction, will be admitted to the regular course without examination.

Students will be credited without examination in subjects for which they can furnish the certificates of high schools.

Applicants who can not complete the common branches at their home district may be admitted to a preparatory class, if they can pass examinations in reading, letter writing, and arithmetic through fractions, or bring third grade certificates from their county superintendents. But all students who can complete the common branches in their home schools before coming, should do so.

THE DINING HALL.

Applicants for admission after the opening of the term will, in addition to the regular entrance examinations. be required to show proficiency in the work done by the class up to the time of their application. All who can not enter by the middle of November should wait until the beginning of the winter term.

Students of mature age, who have but little time for study and who have special needs in the lines of agriculture, stock, and farm engineering, will be registered for special work during the winter term as indicated in the daily program. Such students will be required to pay a registration fee of $5 and to board themselves outside of the institution. It is better for such students to buy the few books they may need than to rent them.

EXPENSES.

The cost to the students, for board and washing, is the actual cost of maintaining the table and caring for the house. This does not exceed $3.00 per week. A month's board is assessed in advance for the purchase of provisions at cash prices. At the end of the month the exact cost is calculated and the proper deduction made from the next assessment. The culinary department is managed by an experienced matron, and all the buildings are under the supervision of the principal. The buildings are illuminated with electric lights, and warmed by steam; the sleeping rooms are each furnished with a bedstead, mattress, dressing bureau, and table.

Each student furnishes four sheets, one pair of blankets, one quilt, one bedspread, one pillow, three pillow cases, two bath towels, comb and brush.

No deductions in charges are made for absence of less than four days. If students are compelled to be absent for that length of time they will be allowed half rates, if they arrange with the matron before leaving.

An assignment of rooms will be made on the day before commencement and will hold good only until and including the second day of the following term when the student's presence will be necessary to make good his claim.

Students wishing to retain their rooms after vacation, must be on hand when the second term opens, or pay one-half the price of board and room for the time they are late. Students who do not engage rooms in advance, may be forced to find sleeping rooms elsewhere at an additional cost of fifty cents per week.

Text books are furnished, at an annual rental of $2, to students who do not desire to purchase.

Drawing tools may be had at a rental of twenty-five cents per term, or may be purchased for about $3. Drawing materials and mimeograph lectures are furnished to students at cost.

Military drill uniform. All students taking military drill are required to provide themselves with the prescribed uniform, which consists of navy blue blouse, trousers, and cap and is as neat and economical a dress as the student can obtain. The suit complete, to measure, will be furnished under special contract for about $10.00.

Fees—Students pay an incidental fee of $1. 25 per term, and also pay for breakages of apparatus used in practical work. In chemistry there is a small fee, about 50 cents, to cover the cost of material used.

Deposit—In addition to the assessment of $12 for board, at the beginning of the term, a deposit of $5 is required of each student as a guaranty for the return of all books, tools and other articles borrowed.

The total expenses for the year need not exceed $85 to each student.

REQUIREMENTS FOR GRADUATION.

First—The completion of the prescribed course of study with an honorable standing in deportment.

Second—An essay of not less than one thousand words upon a topic connected with agriculture or home economics.

Third—For young men, a practical experience in field work at the University Farm or elsewhere, as shall appear in reports received from responsible sources.

The following year's work is offered and required of students desiring to enter the college of agriculture:

FIRST TERM.	SECOND TERM
*Algebra, [5].	Algebra, [5].
*Geometry, [5].	Geometry, [5].
English, [5].	English, [5].
Elective, [5].	Civics, [5].

*Recitations in geometry begin at Book III, Wentworth, and in algebra at highest common divisor.

THE HOME.

The first building erected upon the campus has been remodeled and furnished for a home for the young men. It contains on the first floor the library; a large reading room supplied with good reading, and parlor games; a general sitting room; also a parlor in which students receive visits from friends. In the basement are rooms specially adapted for change from recitation rooms into dining rooms for class parties, which enables students to learn the art of receiving and entertaining company.

The building for young women contains a large sitting room for general use; a parlor for more special use; rooms for the preceptress; and thirty suites of rooms for sixty students, each suite consisting of a study room for two with two alcove sleeping rooms adjoining.

This gives each student a separate sleeping room, a study room for herself and one room-mate, the free use of sitting room and parlor in the girls' home, and the benefit of class parties in the Home Building.

In the large sitting room there are papers, magazines, books, and a piano, which afford pleasant recreation.

STUDENTS' DEBATING SOCIETIES.

Societies for the purpose of improvement in elocution and debate, and for obtaining instruction, in the form of lectures, give excellent opportunities for entertainment and culture.

STUDENTS' CHRISTIAN ASSOCIATION.

This society has for its objects the study of moral and religious subjects, and the holding of regular weekly prayer meetings and conference meetings. All students, regardless of creeds, are welcomed to membership; no sectarian differences are allowed to be discussed in the meetings or in the reading rooms.

The Young Men's Christian Association of the school will station several of its members at the depots to meet and direct incoming students on the arrival of the trains, Monday and Tuesday, October 2 and 3. A member bearing a badge lettered, "Y. M. C. A., S. A. U. M.", will be at each of the following depots: Great Northern, in St. Anthony Park; Union, in St. Paul; Milwaukee, in Merriam Park; and Union, Milwaukee and St. Louis, in Minneapolis. Trunks will be transferred the first and last weeks of the term without expense to students. At other times a fee of 25c will be charged.

Girls' Home Building.

ATHLETIC ASSOCIATION.

The students have a well organized athletic association and a well equipped gymnasium. A competent instructor is in charge each evening. An opportunity is thus given for healthful amusement and for needed physcal exercise.

LIBRARY.

The library contains five thousand books of reference, besides nearly five thousand pamphlets, including reports, bulletins, etc.

The library is supplied with a card catalogue from the United States Department of Agriculture of all reports and bulletins issued by the different experiment stations. This enables one to find some reference on nearly every agricultural subject. In connection with the library is the reading room where all the leading agricultural papers, as well as other leading periodicals, are kept on file for the use of the students.

Quite a number of the instructors have written text books in their own lines of work, and are using them in the lecture rooms.

COURSE OF STUDY.

FIRST YEAR.

FIRST TERM.

Botany [5].
*Drawing [2].
*Music or Gymnasium Work [1].
English [5].

*Blacksmithing [1]. *Carpentry [2]. Carpentry Lecture [1]. *Military Drill [1]. Agriculture [3].	or	*Laundering [2]. *Physical Culture [1]. *Sewing [3]. Social Culture [1]. Field Agriculture [3].

SECOND TERM.

Botany [5].
*Farm Accounts [2½].
*Music or Gymnasium Work [1].
Physiology [5].
Study of Breeds [3].

*Carpentry [2]. Carpentry Lecture [1] *Drawing (farm buildings) [2]. *Blacksmithing [1]. *Military Drill [1].	or	*Cooking [3]. *Drawing (farm houses) [2]. Home Management [1]. *Physical Culture [1].

SECOND YEAR.

FIRST TERM.

Dairy Chemistry [2].
*Dairy Husbandry [2½].
Fruit Growing [3].
*Music or Gymnasium Work [1].
Algebra [5].

Breeding [2½]. *Military Drill [1]. Physics [5].	or	*Cooking [3]. Household Art [1] *Physical Culture [1]. *Sewing [3].

COURSE OF STUDY—*Continued.*

SECOND YEAR.

SECOND TERM.

Agricultural Chemistry [5].
*Dairy Husbandry [2½].
*Music or Gymnasium Work [1].
Physics [5].
Vegetable Gardening [3].
Poultry [1].

Field Crops [5]. *Military Drill [1].	or	*Cooking [3]. Home Economy [1]. *Physical Culture [1].

THIRD YEAR.

FIRST TERM.

*Agricultural Chemistry [5].
Forestry [3].
*Music or Gymnasium Work [1].
Entomology and Zoology [5].

*Handling Grain and Machinery [1]. *Veterinary Science [2½].	or	*Cooking [2]. *Sewing [4].

SECOND TERM.

Civics or Geometry [4].
*Dressing and Curing Meats [1].
Plant Propagation [3].

Feeding [3]. Soils and Fertilizers [5]. *Veterinary Science [2½].	or	*Cooking [4]. Domestic Chemistry [3]. Domestic Hygiene [1]. *Sewing [4].

* Figures in brackets indicate the number of hours per week in which the subject is pursued; all work in subjects marked thus * extend through double time in the daily program.

One essay and one declamation are required of each student in each term of the first two years. Those taking the regular work in the literary societies will be excused from the declamation.

SCHOOL OF AGRICULTURE—PROGRAM FALL TERM 1899.

INSTRUCTOR	8:15-9:00	9:05-9:50	9:55-10:40	10:45-11:30	11:40	1:15-2:00	2:05-2:50	2:55-3:40	3:45-4:30	4:35
Aldrich						C. I. Drawing, 4 Pds.		C. II. Drawing, 4 Pds.		
Blair						B. Sewing, 2, 4. C. Sewing, 1, 3, 5.		B. Sewing. 2. A. Sewing; 1, 3, 4, 5.		
Boss, A						A. Handling Grain and Machinery, 3. Pds.				
Boss, W		A. Power Machinery, 0.				C. I. Carpentry, 5 Pds.		C. II. Carpentry, 5 Pds.		
Brewster	B. Algebra.	G. Geometry.	G. Algebra.							
Drew						C. II. Blacksmithing. 2 Pds.		C. I. Blacksmithing, 2 Pds		
Green			B. Fruit Cul. 1, 2, 3.		C	A. Forestry, 1. 2, 3.				
Hæcker					H	B. Farm Dairying 1, 5.	B I. Home Dairying, 1. B. II. Home Dairying, 3. B. III. Home Dairying, 5, } 3 Pds.			
Hays		C. Agricul. 1, 2, 3.	C. Field Agri. 1, 2, 3.							
Keyes		P. I. Lang.	P II Lang.	C. Language.	A		Music at 6:15 to 7:00 P. M.			
Kiehle		C. Physical Culture, 2, 4.		B. Physical Culture, 2, 4.	P					
Leonhæuser										Mil. Drill, 2 Pds.
Lugger	A. Entomol'y and Zoology				E					
Mahood		P. II. Arith.	P. I. Arith.	G. English.			Gymnastic Work at 8:30 P. M.			
Meredith		C. Social Culture, 5.			L		B. Household Art, 1.			
Reynolds	(C. Physi'gy)							A. Veterinary Science, 5 Pds. 2, 4		
Robertson	C. I. Botany.	C. II. Botany		B. Physics.						
Shaw			C. Study of Breeds, 4, 5			B. Breeding 2,3,4. 2½ Ps.			C. Study of Breeds, 3.	
Shepperd						B Cooking, 3. A. Cooking, 4, 5.		C. Laundering, 1, 2. B. Cooking, 3, 4. Laboratory.		
Snyder		A. Agri. Chemistry.	B Dairy Chem. 4, 5.	Lab. 1, 2, 3, 4. A. I Ag. Chm				A. II Agricul. Chem., 1, 3.		
Vye	P. Penm'ns'p							(C. Accounts, 5 Pds. 3, 4,5.)		
Wilson							P. Reading I.	P. Reading II		

SCHOOL OF AGRICULTURE—PROGRAM WINTER TERM 1900.

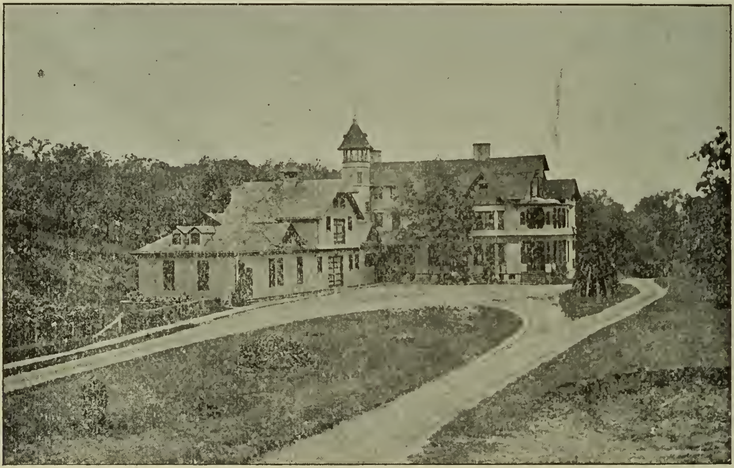
INSTRUCTOR.	8:15-9:00	8:05-9:50	9:55-10:40	10:45-11:30	11:40	1:15-2:00	2:05-2:50	2:55-3:40	3:45-4:30	4:35
Aldrich			Special Drawing, 3.		CHAPEL	C. I. Drawing, 4 Pds.		C. II. Drawing, 4 Pds.		
Blair							A. Sewing. 1, 4.		A. Sewing, 2, 3.	
Boss, A			Sp. Carp. O. Sp. Power M , 1, 2.				A. Dressing and C. Meats, 2 Pds.			
Boss, W						C. I. Carpentry, 5 Pds.		C. II. Carpentry, 5 Pds.		
Brewster		A. Geom. 2, 3 4, 5.	G. Geometry.	G. Algebra.						
Drew			Sp. Blacksmithing, 4, 5. B. Poultry, 1.			C. II. Blacksmithing.		C. I. Blacksmithing.		
Green			B. Veg. Gard. 2, 3, 4.			A. Plant Prop., 1, 4		A. Plant Prop., 5.		
Haecker						B. Dairy Stock 1, 5.	B. I. Home Dairying, 1. B. II. Home Dairying, 3. B. III. Home Dairying, 5.			
Hays	B. Field Crops.	(C. Agr. 1, 2, 4)								
Keyes	P. I. Lang.	(C. Lang.)	P. II. Lang.			Music from 6:15 to 7:00 p m.				
Kiehle		C. Phys. Cult. 2, 4.	B Phys. Cult. 2, 4.							
Leonhæuser										Mil. Drill, 2 Pds.
Mahood	G. English.	A. Civics, 2, 3, 4, 5.	P. I. Arith.	P. II. Arith.			Gymnasium Work at 8:30 p. m.			
Meredith			A. I. A. Dom. Hygiene, I.			B Home Econ., 2.	C. Home Managm't, 5,			
Reynolds				C. Physiology,			A. Vety. Science, 2, 4.			
Robertson	C. Botany.		C. Botany.	B. Physics.						
Shaw	Sp. Stock.	(C. Study of Breeds, 3, 5.)				A. Feeding 2, 3, 5.			C. Study of Breeds. 3.	
Shepperd							C. Cooking, 1. 4.		A. Cooking, 4.	
Snyder	A. Dom. Chem. 3,4,5	B Agr. Chem.	A Soils and Fert.			A. Cooking, 2, 3, 5.		B. Cooking, 2, 3, 5.		
Vye	Penmanship.							C. Accounts, 2, 4, 5. 2½ Pds.		
Wilson		Sp Lang. 3.4.5 Sp. Arith. 0,1,2					P. History.	P. History.		

SPECIAL ELECTIVE WORK.

Graduates and others of equal attainments, are offered the opportunity of entering as special students in mathematics, English composition, farm buildings, and such lines of practical work as they can individually arrange to prosecute with the instructors in charge of such lines.

Each special student is expected to elect at least three lines of work and to do an amount of work in these lines that shall be satisfactory to the instructors in charge.

Any contemplating this elective work should make application to the principal before coming, and should state what lines of work they desire to pursue.



The Farm House.

SPECIAL STUDENTS.

Special students, who do not find a sufficient amount of work in the various lines of lectures and practice work in either the fall or winter term, will be assigned by the registration committee to class work in agriculture. Such work may be assigned in agriculture for the first period, and in stock for the second period.

CHARACTER OF INSTRUCTION.

AGRICULTURE.

The instruction in agriculture continues through the course and is outlined as follows:

The selection and general management of farms; soils and soil formation; drainage; tillage; road making and fence building are taught. The production of grains and grasses, clovers and other forage plants; the management of grass lands; the rotation of crops and the management of fields in relation to fertility, to weeds, to live stock and to profits, are considered. Many special subjects, such as breeding field crops, stacking grains, handling machinery, and exterminating noxious weeds, are dealt with. Green manuring, management of farm manures and the place of commercial fertilizers in field management in various parts of the state, are discussed.

University Experiment Farm is conducted partly with reference to instruction. A number of students are engaged each summer to assist in the experimental work with field crops and field management, also the preservation of crops in silos and other ways. Many conveniences on the farm serve as models of their kind. A museum of a limited number of the best modern farm machines is maintained.

AGRICULTURAL CHEMISTRY.

The first term is devoted to the study of the general principles of the science of chemistry, particular attention being given to those elements and compounds which are the food of plants and animals. This work is illustrated by the many chemical changes which take place on the farm; the student spends a part of his time in the laboratory performing experiments which relate to the subjects which are studied in the class-room.

In the second term the chemistry of farm products is begun. The composition of human and animal food stuffs forms an important part of this term's work. The chemical changes which take place during the growth of crops are studied, as well as the various factors which influence the food value of agricultural products. During this term one period each day is given to a class-room exercise, and one period is spent in laboratory work. In the laboratory, the student separates the various compounds of which food stuffs are composed, and he also studies the various types of food materials.

One term is given to the chemistry of soils and fertilizers. The requirements of the various farm crops in the way of food, and the best ways of satisfying these demands are considered. The various forms of plant food which exist in the soil, the chemical changes which the plant food undergoes, and the power of crops to make use of the various compounds of the soil, form important parts of this work. In the study of soils and fertilizers, it is the aim to study the principles which govern the maintenance of the fertility of the soil.

In the chemistry of dairying, instruction is given in the chemical and allied changes which take place in the handling of milk and in its manufacture into butter and cheese.

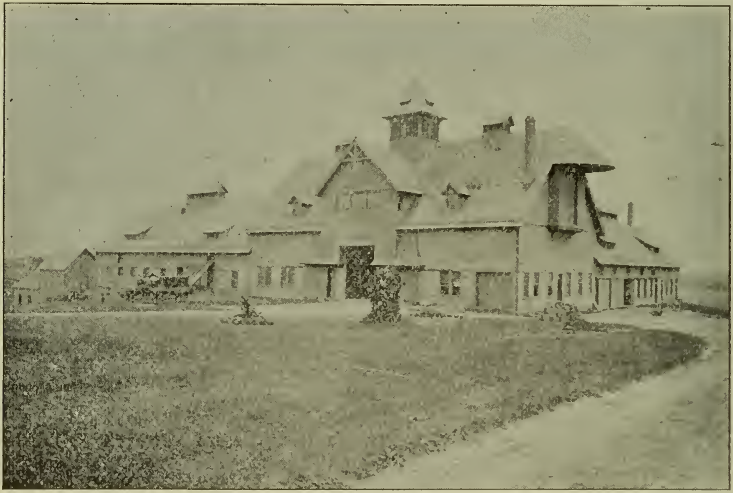
ALGEBRA.

Algebra is required during the first term of the second year. This work covers Wentworth's elements to highest common factor. Special attention is given to literal notation, negative numbers, the equation and factoring.

The work in the additional fourth year covers Wentworth's elements to logarithms.

ANIMAL INDUSTRY.

The talks on animal industry are most practical. The characteristics of the leading pedigreed breeds that have special adaption to northwestern conditions, are discussed. The points of good and inferior animals in beef-cattle, sheep, and swine are so taught that the student may learn to choose wisely when selecting foundation animals from which to breed, or animals to prepare for the block. The fundamental principles that govern breeding, are pointed out in the simplest manner possible. The feeding of animals is discussed, special prominence is given to the choice of foods for live stock at the different stages of their development and to the preparation of the same for breeding. The general principles which relate to the care and management of cattle, sheep and swine are made clear. And as far as practicable, these talks are illustrated by the presence of the living specimens of the various animals under discussion.



The Barn.

ARITHMETIC.

Students entering the preparatory class in arithmetic are required to understand arithmetic through fractions, both common and decimal. The course gives special attention to denominate numbers, percentage in its various forms, interest, discount, evolution, and mensuration. The aim is to secure both accuracy and facility in the most practical operations.

BLACKSMITHING.

The students are instructed in the management of the forge and fire, and in bending, shaping and welding iron and steel. They are required to make links, rings, hooks, bolts, clevises, whiffletree-irons, tongs, cold-chisels, punches; in short, to become familiar with all the operations necessary to enable them to do their own repair work when they return to the farm. Particular attention is given to rapid and accurate welding and to the shaping and tempering of steel tools. The forges used are such as any farmer can make for himself, and each student is taught to make his own tools, so that he will be able to furnish his shop with very little outlay.

BOTANY.

This study is taught with special reference to its bearing upon the every-day problems that present themselves to the farmer and gardener. It is profusely illustrated with flowers and plants from the greenhouse and nursery. Some instruction is given in the use of the compound microscope; students are thus enabled to study intelligently, in an elementary way, the tissues of plants. By this means they get a clear idea of the general principles of plant structure and vegetable physiology.

CARPENTRY.

Instruction is given by means of text-books, lectures, and work in the shop and drawing room, in the care and use of tools, including setting and filing saws, filing bits, grinding plane-irons, chisels and other tools; also in laying out work and framing buildings. Methods of construction are illustrated by models and drawings. Various articles for use about the farm are manufactured by the students.

CIVICS.

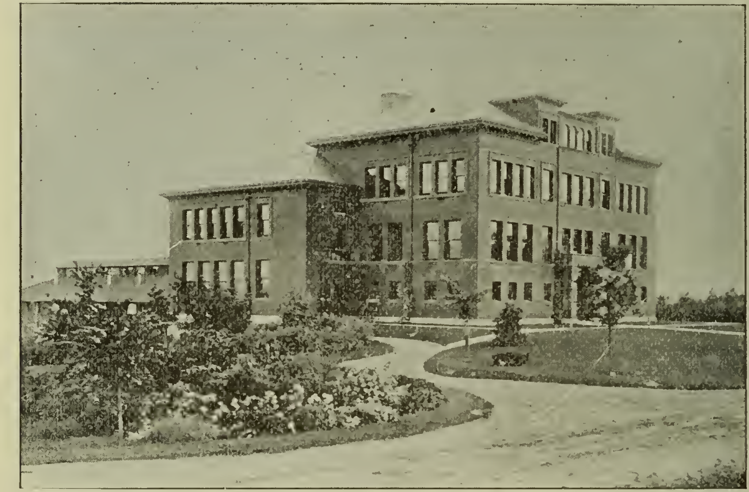
During the last term of the course, students receive instruction in this science, and graduate with a good understanding of the origin, necessity, nature, and various forms of government, and the machinery employed to carry on public works, establish justice, and provide for the common defense; of the organization and management of local institutions, the town, the village, the city, and the county; the manner in which states are created and their affairs administered; the three departments, legislative, judicial and executive, and the functions of each; the interdependence of the state and its citizens, as well as the powers and obligations of each, by due attention to which the state may be strengthened and the condition of its citizens ameliorated.

The relation of the state to the general government; the constitution and the powers it confers, and the provisions for amendments are taught. The more important principles of commercial law, including contracts, agency, partnership, corporations, and commercial paper, receive attention. Instruction is also given in the United States method of surveying public lands.

COOKING.

The course in cooking extends through five terms of the curriculum as given below, with the subjects covered in each term.

Second term, C year—Kitchen management; care of cooking utensils, glass, china and silverware; measuring and invoicing; cooking vegetables, cereals and breads.



THE DRILL HALL.

First term, B year—Canning, preserving, pickling and jelly making; soups, eggs and meats.

Second term, B year—Marketing, care of foods, and cold storage; fruits, salads, hashes, croquettes, "save all" dishes, and lunch baskets; equipment of dining room and table service.

First term, A year—Mixed soups, desserts of various fruits harmoniously combined; proper combination of flavors and colors in garnishing food; mixing and seasoning foods; carving and serving meats.

Second term, A year—Food rations, dietaries and bills of fare; invalid cooking, beverages, frozen dishes, pastry and cake; food economics, table duties of host and hostess and essays on housekeeping.

DAIRY HUSBANDRY.

Dairy Stock—During the last month of the first term, students receive instructions in regard to characteristics of the various breeds of dairy cattle, their origin and comparative adaptability for the dairy. During the last term instruction is given in breeding, rearing, feeding and handling dairy stock with practice work in judging stock and formulating rations.

Farm Dairying—During the first term a course of lectures is given in farm dairying, giving instruction in the care of milk and utensils, explaining the principles involved in creaming milk by the gravity and centrifugal processes and giving full instruction in regard to running farm separators and the manufacture of butter and cheese in the farm dairy. Students also receive practical training in the most advanced methods of creaming milk, ripening cream, churning, working and packing butter and measuring the value of milk by the Babcock test and lactometer. This practice work begins the third week of the first term and continues through the school year.

DOMESTIC CHEMISTRY.

In domestic chemistry instruction is given in the chemistry and economy of human foods. Simple tests for the detection of the adulteration ot foods are given. The chemistry of cleaning material, and the composition of various household articles are considered. The instruction is given in the form of laboratory practice.

DRAWING.

The student is taught the practical value of drawing for the purpose of designing and arranging buildings, machinery, etc. He makes drawings of the shop exercises then works from his own drawings, thereby learning the application.

Designs are made for dwellings, barns, out-buildings, and machinery. As practical subjects for their designs, students are requested to bring from home data for plans of buildings needed on their farm. Estimates are made of the amounts of materials required and cost of construction.

Special students are offered advanced work in designing, including style, stability, convenience and economy in arrangement of buildings and machinery for various purposes.

DRESSING AND CURING MEATS.

Instruction is given in a course of lectures and demonstrations.

Two weeks' practice work in dressing, curing, and cutting up beef, pork, mutton, veal, and poultry is required of each student before graduation.

ENTOMOLOGY.

The class in entomology receives instruction of a practical nature. The course is divided as follows:

Classification of insects, sufficient to enable the student to distinguish between useful and injurious insects and to apply remedies intelligently, as the remedies must be selected according to the kind of insect to be combatted.

Insecticides and their application; the most approved methods of using arsenical poisons, kerosene emulsions, pyrethrum, and other preparations are taught.

Natural remedies and nature's methods of preventing increase of injurious insects receive due attention so as to enable the student to apply their teachings. The relation of other animals to insects is also taught, so that the student may know both his friends and his foes. Special attention is given to injurious and useful insects of Minnesota.

GEOMETRY.

Geometry is offered in the second term of the third year, as an elective in place of civics to those who wish to prepare for a college course. This work covers the first two books of Wentworth's Plane Geometry.

The work in the additional year covers Wentworth's Plane and Solid Geometry.

HANDLING GRAIN AND MACHINERY.

During the fall term of the third year a course of lectures on the use and selection of farm machinery is given and the principles governing the proper methods of shocking and stacking grain are taught by means of demonstrations and practice work.

HOME ECONOMY.

This work is taught as the just proportion between income and expenditure; the distinction of economy, frugality, and parsimony are considered with reference to a definite proportion in the expenditures which are made for existence, comfort, culture, and philanthrophy. A study is made of the sources of income, especially of the income from the farm in the form of house, food, and luxuries. The purchase of clothing, household stores and furnishings is considered from the standpoint of the suitable. The relation of cash and credit to cost is also considered. Attention is given to savings and forms of investment, a bank account and the use of a check book. Each student in this class is required to submit at the close of the term a paper setting forth in detail the use of a certain named income for one year, embracing not only every item of necessary home expense but also an outlay made for travel, luxuries, accident, sickness and other emergencies. The habit of keeping a household account is calculated to strengthen the judgment in making a wise use of money, therefore an analysis and study of expenditures as here indicated serves to bring clearly before the student's mind the relative importance of the different things which money will procure.

HOME MANAGEMENT.

This includes both housekeeping and home making, and the teaching of the subject naturally falls into three divisions, household work, sanitation and family life. The instruction is based upon the belief that housekeeping is as important as it is difficult,—and that home making is the noblest form of human endeavor. The points in detail in the preparation of food, the making of clothing, the care of the house and household belongings, and the ordering of the family life are considered in their relation to an adequate plan for home management To start the student in the correct way of becoming mistress of the business of housekeeping is the end sought. It is believed that for one who knows the reason for the doing there is no drudgery, therefore students are taught the specific danger that lurks in dust and dirt, in order that they may understand the dignity of the unceasing war which the housekeeper makes upon these forces. The practical benefit to be derived from the knowledge students have gained in the cooking, sewing laundering and dairy classes is emphasized and shown it its relation to an adeqaute plan for the daily program for the home. While the science of family life has not been formulated, yet some of its fundamental principles are recognized and may be taught.

HORTICULTURE AND FORESTRY.

Fruit growing is taught with reference to raising fruit for market.

Vegetable gardening embraces the study of garden tillage, irrigation, and rotation of crops; transplanting; formation and care of hotbeds; study of garden insects, and the growing of various vegetable crops.

Plant propagation—In this subject the principles underlying the development of cultivated varieties of plants and seed testing are taught; also the propagation of plants by seed, cuttings, grafting, and budding.

Forestry inclndes the consideration of the formation and care of wind breaks and shelter belts, the laying out and planting of home grounds; discussion of the hardiness, habits, and value of our native and introduced trees; and the methods of propagating them.

The work of the class room is illustrated by the orchards, nurseries, forest plantations, gardens, and greenhouses on the grounds of the experiment station and by visits to commercial nurseries and greenhouses near by.

DAIRY BUILDING.

HOUSEHOLD ART.

This is taught by a series of lectures treating of the adornment of the house and grounds, noting the distinctive character of the country home, and opportunity for embellishment found in the surroundings. The intention is to show that thought and energy can accomplish as much or more than money in making a farm home attractive; also to show the importance of acquiring correct knowledge and correct taste in order to secure every possible convenience, combined with harmonious forms, colors and styles in walls, draperies, and furniture. The true relation of beauty, use and influence of surroundings upon life and character are considered in connection with the possibilities for improvement that may be found in simple and inexpensive methods.

HYGIENE.

Hygiene as a special study for women, considers the health of the family as dependent upon pure food, pure water, personal cleanliness and proper habits, as well as upon heredity. The aim is to show how a correct knowledge of the laws of nature is essential not only to the restoration but to the preservation of health.

Several lectures by a physician will be given upon maidenhood, maternity, motherhood, infancy, and related subjects. These special lectures will be supplemented by the regular lectures in class, thus extending and simplifying the subjects in plain and easily understood terms.

LANGUAGE.

The work in language aims to secure the use of proper words and correct forms of expression in conversation, letter-writing, and the more extended forms of composition. The student is led to think, to analyze and define his thought, to choose words that will accurately express it, and to arrange these words in harmony with the rules of grammar, the forms of correspondence, and the elementary principles of rhetoric. Attention is given to the sounds of letters as indicated by their markings; the meaning of prefixes, root syllables, and suffixes; classification, inflection and the syntax of simple, complex and compound sentences; the nature and correction of common errors; practice in letter-writing and descriptive composition.

One essay of about five hundred words is written, snbmitted for criticism, corrected, and re-written during the first two months, of each term of the first two years of the course.

This analytic method naturally leads to the study of not only the dictionary, the grammar, and the rhetoric, but also of authors speakers, periodicals, and all good authorities on language.

LAUNDERING.

In the first term of C year several lectures are given and practice work is provided in washing, ironing, starching, polishing, cleaning, and pressing clothing.

MUSIC AND PHYSICAL CULTURE.

Classes in music and physical culture will be organized for students desiring training in these branches.

PENMANSHIP AND ACCOUNTS.

In this department the student is taught to write a plain hand with rapidity and ease. The work in accounts is applied to the transactions which the student meets in the various duties on the farm. He is so taught to keep his accounts that he may know at any time the profit or loss of any department of his business, and is thus enabled to plan intelligently.

Attention is given to the different kinds of negotiable paper; the various forms of endorsements and their effect; business forms and correspondence. Everything is made plain and practical, and students can learn to keep accurately and neatly the accounts of an ordinary business.

PHYSICAL CULTURE.

The work in this department is particularly directed to the improvement of nutrition and the correction of faulty habits of carriage and posture, frequently the result of exercise taken in the performance of household tasks which have a tendency to produce overdevelopment of certain muscles, while leaving others almost unused. The course of study includes free gymnastics, and the use of light apparatus, supplemented by movements taken from the Delsarte system of expression.

There are two classes, one for elementary, and the other for advanced work.

PHYSICS.

The general principles of the science are taught, special stress being laid upon those which to the greatest extent enter into the business of the farmer. About half the time is devoted to experimental work, which includes capillarity of soil; diffusion and osmosis of gases and liquids; heating, lighting, and ventilation; farm machinery in particular, pumps, eveners, —especially three and four horse,—pulleys, milk-testers, centrifugals, incubators, wind-mills, steam, and gasoline engines; friction and lubricants; tensile strength of wire and binding twine of different grades; lightning, and lightning protection. The foregoing indicates the character of the work, the attempt being to give the student an acquaintance with the laws of nature that he may act with reason and work to advantage.

PHYSIOLOGY.

During the first year the students take a high school course in human physiology and hygiene. In this course they study the general plan and structure of the body and the tissues of which the body is composed; then the skeleton, muscles, and body nutrition. Body nutrition includes a study of foods, digestive organs and fluids, and processes of digestion.

The class then studies in succession, circulation and respiration, including ventilation, respiratory apparatus, kidneys, skin, nervous system, senses, voice, and narcotics including alcohol, opium, morphine, chloral, cocaine, and tobacco.

This class work is illustrated by means of large charts, skeletons, manikins, and dissections. Important points of difference between human and animal physiology are pointed out in preparation for the third year's work in the veterinary class. Matters of home and personal hygiene are interwoven with the physiology work.

POULTRY.

In the introduction in this subject, the following will be considered: history and characteristics of the leading breeds of poultry; breeding, feeding, and management of fowls for eggs, and for the market; planning, building, and arrangement of poultry houses, managing incubators and brooders. A model poultry house, containing pens of the most improved breeds, incubator cellar, workroom, etc., has been provided, where experimental work and practical instruction are carried on.

POWER MACHINERY.

Special students of mature years who desire to become proficient in the management and care of stationary engines and boilers, or threshing engines either steam or gasoline, will be given a chance to pursue special work in the care and management of such machinery. Instruction will be given by means of lectures and practical work in the engine room. Boilers, engines, injectors, pipe fitting, wind mills, well pumps, hydraulic rams, etc., will receive special attention.

SEWING.

During the first year students receive instruction in the elements of sewing; different stitches, such as basting, seaming, hemming, darning, buttonholing and patching are taught; and practice is given in the use of all the implements belonging to the sewing basket.

The second year's work consists of cutting and making plain garments, such as underwear, children's clothing, shirt waists and cotton dresses.

In the third year, the more difficult work of dressmaking is taken up. The cutting and fitting of dresses and jackets are taught by a very simple system; careful attention is given to quality of materials and harmony of colors. The course is designed to make each graduate capable of doing all kinds of sewing needed in the home.

SOCIAL CULTURE.

A course of lectures is given on the usages of good society, including manners, behavior, the voice, conversation, forms of address, invitations, etc. Attention is directed to the fact that all approved etiquette rests upon the great law of kindness. The importance is shown of personal fitness for society through attention to the laws of health and to personal habits, as well as through the refinement of a cultivated mind and sympathetic spirit. Suggestions are made in reference to reading, literary taste and the choice of books. Especial stress is put on the thought that the family life ought to be the highest expression of good society, and therefore the manners and conversation in the home should be the very best of which one is capable. Next in importance to the power of thinking correctly is the power of approaching others with ease and speaking with tactful directness, and consequently any study or practice intended to cultivate the social nature deserves earnest attention. Some instruction is given in the elementary principles of parlimentary usage.

VETERINARY SCIENCE.

During the A year the students take up a course of study in veterinary medicine, the purpose of which is to fit them for intelligent care of their farm stock but not to make them in any sence professional veterinarians. In this course the teaching is done by means of lectures, distribution of mimeographed lecture notes after each lecture, reviews and clinical work at the hospital maintained for this purpose. Lectures are illustrated by means of charts, manikin of horse, skeleton of horse, and various other appliances.

The lecture course consists of a series on each of the following subjects: elementary anatomy, elementary pathology, causes and prevention of diseases, diagnosis and treatment of common diseases, and a final short course on common medicines, studying their effects, uses, and doses. At the hospital clinics, students are enabled to examine and care for a variety of cases and to learn the elements of diagnosis for the more common diseases and forms of lameness.

ZOÖLOGY.

Chiefly Minnesota animals are considered: (1) their classification; (2) their habits and food; (3) their relation to the farmer. To assist the students in their work, a museum has been started in which is shown the relation of Minnesota animals, birds, reptiles, etc., to agriculture. Soils, minerals, fossils, plants,—both useful and injurious,—are also on exhibition.

Dairy School.

SPECIAL ANNOUNCEMENT

FOR THE

TERM BEGINNING JANUARY 2, 1900.

THE FACULTY.

Cyrus Northrop, LL. D., *President.*
William M. Liggett, *Dean.*
T. L. Haecker, *Professor of Dairy Husbandry, in charge of School.*
Harry Snyder, B. S., *Dairy Chemistry.*
Otto Lugger, Ph. D., *Bacteria in Dairy Products.*
W. M. Hays, M. S., *Forage and Pastures.*
M. H. Reynolds, M. D., V. M., *Diseases of the Dairy Cow.*
J. A. Vye, *Creamery Records and Accounts.*
Wm. Robertson, B. S., *Care of Boiler and Engine.*
C. R. Aldrich, *Dairy Buildings.*
J. M. Drew, *Silo and Stable Conveniences.*
B. D. White, *Instructor in Butter Making.*
A. J. Glover, *Instructor in Cheese Making.*
Wm. Boss, *Instructor in Practical Engineering.*
E W. Major, *Instructor in Sweet Curd Cheese Work.*
N. H. Fulton, *Assistant in Creamery.*
L. R. Hobart, *Assistant in Creamery.*
H. C. Haecker, *Instructor in Dairy Laboratory.*

The next session of the Dairy School will begin January 2, 1900, and continue four weeks.

This course is designed to furnish persons who are actually engaged in the manufacture of butter and cheese, or who purpose to take up this work, an opportunity to become more skilled in their work, and also to study the many problems which have a direct bearing upon the dairy industry. Recognizing the fact that such persons cannot be away from business for a long period, the term has been so arranged that the time of each student is fully occupied by lectures and actual work every hour of every working day of the term.

The rapid growth of the dairy industry in the Northwest calls for a corresponding enlargement of the work in dairy instruction. To meet this want, the dairy hall has been more than doubled in capacity and equipped with all apparatus necessary to give instruction in the various lines of dairy work.

No pains will be spared to maintain the high standard which the school has attained. Each member of the faculty has special qualifications for the duties to which he has been assigned. The lecture course and practical instruction are arranged with special reference to giving the greatest amount of training and practice possible, in a four weeks' session. Large additions have been made to the equipment of the dairy hall in both butter and cheese departments; in fact, it has everything needed for conducting the work by the most approved methods.

Instruction is divided into six courses:

1st. Lectures covering the entire field of dairy husbandry.
2d. Practical work daily in the butter room.
3d. Practical work daily in the cheese room, where the manufacture of flats, cheddars, Swiss, brick, Edam, and Gouda cheese will be carried on.
4th. Practice work in the laboratory, examining milks, making daily composite tests, and the pasteurization of milk and cream.
5th. Practical engineering, steam-fitting and plumbing.
6th. Practical work in factory bookkeeping.

I.—LECTURES.

The course of sixty lectures furnishes in a plain and concise form the most valuable informatian for those who are interested in any branch of agriculture, covering, as it does, the most important points in the breeding, rearing, feeding and general management of dairy stock, the economical production of milk, growing and preserving of forage and grain crops, the management of meadows and pastures, management of barns, stables and yards, construction of silos, co-operative dairying, creamery and cheese factory management, judging and marketing dairy products, the chemistry of milk, dairy bacteriology, engineering, animal hygiene and treatment of the common diseases of the dairy cow.

II.—BUTTER MAKING.

The running of separators; ripening and churning of cream; the proper acidity of cream to secure best flavor, how to churn, wash, and salt butter so as to avoid specks and mottles; to secure good grain and best methods of preparing for market, are some of the points which receive special attention. As all creamery men should be able to judge butter from a commercial standpoint, students are trained daily in the art of scoring butter by the score-card.

III.—CHEESE MAKING.

The work in the cheese room is conducted on a large scale, including the manufacture of several brands of fancy cheese. The fact that there is a demand for these at highly remunerative prices has induced the Regents to provide the necessary means for carrying on this work.

A complete record of every step taken is required of each student. Here is a good opportunity for cheese makers to meet; investigate new methods; make experiments on doubtful points; compare notes, and thus gather in a few weeks knowledge that otherwise would take years to acquire

IV.—MILK TESTING.

The recent invention of the milk-test has revolutionized the methods of declaring dividends in co-operative dairying. It has been found that the value of milk for both butter and cheese is measured by the per cent of fat content, and nearly all factories and creameries now pay on the "relative value plan." It is therefore necessary for every factoryman to familiarize himself with the best methods of milk testing. The chemist gives a general outline of the work; but in order that each student may have practice in milk testing, daily exercise is given. Steam, turbine and hand power machines and other apparatus are provided and operated in the laboratory.

The pure and wholesome milk and cream supply for our cities is a matter of vital importance, and there is great need for improved methods of handling milk intended for this purpose. To meet this, a milk and cream pasteurizing apparatus has been manufactured specially for our dairy school, and a few advanced students will be given instruction in the process.

V.—MOTIVE POWER.

The work in engineering consists of practical talks on the construction, care and management of creamery engines and boilers, pumps, injectors, heaters, etc., and work in the practice room.

In the practice room is provided an eight horse power, simple, slide-valve engine, three types of boiler feed pumps, two types of deep well pumps, one injector, two milk pumps, and a steam gauge, which the students have the privilege of examining and operating. Instruction is also given in pipe fitting, placing shafting, babbitting bearings, soldering, etc.

It is the aim to make this work as practicable as possible. Questions of interest on the subject are freely discussed.

VI.—FACTORY BOOKKEEPING.

All the essential features of factory accounting from the receipt of the milk to the returns in net proceeds are thoroughly considered. Paying for the milk according to the fat content, or otherwise, is fully explained. The students do, in books provided, the actual one month's accounting of a creamery.

REQUIREMENTS FOR ADMISSION.

Experience has shown that students who have had some practical training in the creamery or cheese factory before coming to the dairy school are, as a rule, the ones who are able to make the most of the course; it is therefore required that persons who intend to take this course shall have at least one season's experience before coming to the school. No entrance examination is required.

EXPENSE.

A registration fee of $15 is required of each student. Students can board in either city and reach the school by street car, or board can be secured near the school for from $3.50 to $4.00 per week. Each student is required to supply himself with two white suits, including caps, to be worn during working hours in the creamery and cheese rooms. The suits may be procured for about $1 each.

DAIRY CERTIFICATES.

The Regents will grant Dairy Certificates to students who have taken the course and passed a satisfactory examination and in addition have demonstrated by one year's work in a factory that they are skilled in the art of butter or cheese making, and are thoroughly qualified to take charge of a creamery or cheese factory.

To reach the school from either St. Paul or Minneapolis take the Como Interurban Harriet street car and get off at Dooley avenue.

Address applications for admission to T. L. Haecker, St. Anthony Park, Minn.

The Agricultural Experiment Station.

OFFICERS OF THE STATION:

WM. M. LIGGETT, *Director.*
WILLET M. HAYS, M. Agr., *Agriculturist.*
SAMUEL B. GREEN, B. S., *Horticulturist.*
OTTO LUGGER, PH D., *Entomologist and Botanist.*
HARRY SNYDER, B. S., *Chemist.*
T. L. HAECKER, *Dairy Husbandry.*
M. H. REYNOLDS, M. D , V. M , *Veterinarian.*
THOS. SHAW, *Animal Husbandry.*
T. A. HOVERSTAD, B. AGR., *Sup't of Sub-Station, Crookston.*
HERMAN H. CHAPMAN, B. S., *Sup't of Sub-Station. Grand Rapids.*
ANDREW BOSS, *Asst. in Agr., Univ. Farm.*
R. S. MACKINTOSH, *Asst. in Hort., Univ. Farm.*
J. A. VYE, *Secretary.*

The purpose of the Agricultural Experiment Station of the University of Minnesota is to bring home to the farmers of this State the importance of the practical application of agricultural science and to discover facts and processes that will be of permanent value to the rural husbandry of Minnesota. This station was established in 1887, under a law by the U. S. Government appropriating funds for experimental work in each state, and since then has published 61 general and 9 press bulletins that embrace a wide range of agricultural subjects included under the heads of dairying, animal husbandry, entomology, botany, horticulture, forestry, chemistry and general agriculture. These bulletins are issued for gratuitous distribution to the citizens of this State, and of each general bulletin fifteen thousand copies are printed. The station is located at University Farm, St. Anthony Park, Minn. Most of its officers are also employed in the school and college of agriculture. Its equipment consists of 250 acres of land embracing a variety of soils and exposures; a large general purpose and stock barn; a good sheep barn; piggery and hennery; a collection of various breeds and kinds of animals; nurseries; forest and small fruit plantations; orchards; gardens; greenhouses and museum. The offices, laboratories and work rooms of the school of agriculture are also used for the work of the experiment station, which has become widely and favorably known in this State. Several of the railroads in the State make a point of encouraging the farmers along their lines in visiting the station by giving reduced rates for this purpose. The work at University Farm is supplemented by the Sub-Station located at Grand Rapids, on land that is characteristic of the northeastern part of the State; and by the Sub-Station located at Crookston, on land that represents the soil of the Red River valley. Each of these farms is equipped with buildings and machinery, and is in charge of a competent superintendent. Experiments are also carried on at the farm of Sup't. O. C. Greeg, in Lyon Co. (Coteau Farm), which is typical of the agricultural lands of that section.

PUBLICATIONS OF THE AGRICULTURAL DEPARTMENT.

BULLETINS OF THE EXPERIMENT STATION FOR 1898.

Bulletin 56—Sugar Beets. Summary and Investigation from 1888 to 1898. Report for 1897. Proposed Experiments for 1898.

Bulletin 57—Fattening Lambs in Winter. 1—Fattening Minnesota Lambs. 2—Fattening Range Lambs. 3—Fattening Range Lambs.

Bulletin 58—Fattening Steers in Winter. 1—Fattening Minnesota Steers. 2—Fattening Range Steers.

Bulletin 59—Fattening Lambs and Wethers in Winter. 1—Fattening Home-Grown Lambs. 2—Fattening Home-Grown Lambs. 3—Potatoes and Field Roots for Fattening Lambs. 4—Fattening Range Wethers. 5—Fattening Range Wethers.

Bulletin 60—Beef Cattle and Swine. 1—Growing Beef in Minnesota. 2—Fattening Range Steers in Winter. 3—Feeding Pigs of Different Grades.

Bulletin 61—Butterflies and Moths Injurious to Our Fruit-Producing Plants.

THE FARM STUDENTS' REVIEW.

The Alumni Association of the School of Agriculture is publishing an agricultural paper, the Farm Students' Review, which is now in its fourth year. This is proving a most important agency in the development of the department and of agriculture in Minnesota.

Students.

THE COLLEGE OF AGRICULTURE.

SENIOR CLASS—5.

Chapman, Herman Haupt, *B. S.*, Grand Rapids.
Glover, Arthur James, Zumbrota.
Hummel, John Adolph, St. Anthony Park.
Major, Ernest William, St. Anthony Park.
Sorkenss, Henry Oscar, Ashby.

JUNIOR CLASS—5.

Clark, Robert Wallace, Northfield.
Houlton, Samuel Randolph, Elk River.
Scofield, Carl Schurz, Bloomington.
Wheeler, William Archie, Winnebago Valley.
Wilson, James Alexander, Lake City.

SOPHOMORE CLASS—8.

Aune, Beyer, Starbuck.
Bull, Coates Preston, Edina Mills.
Mackintosh, Roger Sherman, St. Anthony Park.
Palmer, William Carl, Somerset, Wis.
Riley, Edward Henry, Hammond.
Tasa, Helge Ludwig, Holden.
Thompson, Mortimer Lee, LaCrosse, Wis.
Washburn, Robert Mann, Monticello.

FRESHMAN CLASS—3.

Buell, Max Whitney, St. Anthony Park.
Ryder, Frank James, Buffalo.
Taylor, Charles Philip, Hamline.

GRADUATE STUDENTS—2.

Hoyt, Ben Terril, St. Paul.
Hunter, Clarence Clement, St. Anthony Park

A CLASS—34.

Allard, Eugene Kingsley, Spring Valley.
Andrews, Grace Bacon, Faribault.
Carlyle, Adam, Lynd.
Cooley, Robert Faulkner, Otsego.
Cross. John Frederick, Childs.
Cross, Orville William, Childs.
Clark, Bertram Galen, Hankinson, N. D.
Denison, Martha, Faribault.
Gaumnitz, Daniel Asher, St. Cloud.
Gray, Benjamin Asbury, Lintonville.
Graham, Francis, Roberts, Wis.
Guthrie, Francis Burrell, York, N. Y.
Hale, Charles Willey, Kedron.
Halverson, Bernard, Norway Lake.
Howe, John George, Kellogg.
Krum, Henry Garfield, Minneapolis.
Kamrud, Edward Theodore, Starbuck.
Lang, Nellie May, London.
Lund, Melvin Bethuell, Vining.
Lugger, Humboldt, St. Anthony Park.
Marshall, Frank Foskett, Crow River.
Malberg, Sidney John, Cannon Falls.
McGuire, Clinton Eugene, Stillwater.
Olson, Oscar Edward, Welch.
Powell, Steven Rutherford, Stillwater.
Raveill, Edgar Eaton, Heron Lake.
Roberts, Wilson Clay, Roberts.
Sick, Fred Martin, Duluth.
Talle, Christen Johan, Kenyon.
Tanner, Forrest Oscar, Brownsdale.
Ulland, Lewis, Moscow.
Widmoyer, Leslie Rudolph, Dresbach.
Wilson, Archie Dell, Davies.
Ziegler, Warren, Minneapolis.

B CLASS—32.

Anderson, Alvin Theodore, Rush City.
Boutwell, Edwin, Kasota.
Brewster, John Ronney, New Lisbon, Wis.
Briggs, Ealy Grannis, Houston.
Cady, Leroy, Buffalo.
Eaton, Heber Wheeler, Ludden, N. D.
Erickson, Oscar, Minneapolis.
Gronewald, Arthur John, Faribault.
Hoagland, Ralph, Wayzata.
Hodnett, Royal William, Stillwater.
Lamb, Elton Ray, Oak Centre.
Ley, Joseph Henry, Smithfield.
Loughlin, John, De Graffe.
Liggett, Alfred Russell, St. Anthony Park.
Matthews, Mary Lockwood, Cambridge City, Ind.
Mossman, Isaac, Birch Lake.
Olstad, Casper, Hanska.
Olson, Bennie, Corning.
Peters, Theodore Andave, Thielman.
Pfeiffer, Alfred Lawrence, Olivia.
Pratt, Celia Jane, Bethel.
Pratt, Sumner, Bethel.
Praught, Donald, St. Michael Station.
Pryor, Howard William, Glencoe.
Sandburg, Victor, St. Anthony Park.
Solem, Olaf, Brighton.
Tanner, Alice, Brownsdale.
Thompson, James, Lanesboro.
Thompson, Mortimer Leo, LaCrosse, Wis.
Ueland, Justus, Edgeley, N. D.
Wells, James Eugene, Monticello.
Wilcox, Estella Willa, Hugo.
Wilson, William Phillips, Lake City.

C CLASS—110.

Anderson, Arthur Henry, Rowland.
Andrews, Lewis Frederick, Green Valley.
Apple, Frank James, Thielman.
Atz, Howard, Hancock.
Atz, Asterley, Hancock.
Amidon, Perry Nelson, Houston.
Bakken, Louis Andrew, Granada.
Biery, Elizabeth Anna, Wasioja.
Boerner, Emil Gottlieb, Buffalo,
Boss, Alex, Zumbro Falls.
Boushka, Joseph, Silver Lake.
Boyle, William Henry, Stillwater.
Buell, May Whitney, St. Anthony Park.
Busian, Gerhard, Dover.
Carel, Annie Cora, St. Paul.
Cosgrove, Beth Cora, Le Sueur.
Chowen, Lewellyn, Minnetonka.
Cutting, Fred Ervestine, Byron.
Cuzner, Harold, Minneapolis.
Clute, Rose, Dundas.
Danielson, George Adolph, Goodhue.
Davison, Charles Bradley, Granada.
Dean, George Edward, Bloomington.
Denison, Mary Agnes, Faribault.
De Vaney, Dominick, Hegbert,
Dickerson, Loren Bixby, Stately.
Emmans, George Martin, St. Francis.
Erickson, Agnes, Hector.
Evenson, Robert Benjamin, Strout.
Evenson, Hans Olaf, Strout.
Fellows, Ernest Melvin, Smiths Falls.
Firmin, Alfred Fouracre, Minneapolis.
Frank, James, Warren.
Frear, Jennes Boughton, Minnetonka Mills.
Gibson, Robert Cary, Merriam Park.
Giesmann, August Rudolph, St. Paul.
Giesmann, Elma Alice, St. Paul.
Grafft, Clarence Curtis, St. Paul.
Grant, Arthur Dow, Walcott.
Grant, Donald, Hudson, Wis.
Hanson, Andrew, Sleepy Eye.
Haynes, Calvin, Winneconne, Wis.
Held, Ella, St. Anthony Park.
Hilleman, Lizzie Anna, Arlington.
Holen, Edward Christian, Pelican Rapids.
Holteen, Homer Benjamin, St. Peter.
Hompe, Bernard Antony, Deer Creek:
Hompe, Howard Ernest, Deer Creek.
Howland, Jesse, Northfield.
Humphrey, Alice, St. Paul.
Hunt, William, Minneapolis.
Huntington, Aurelia Louise, Windom,
Ingalls, Herbert Benjamin, Blooming Prairie.
Jackson, Gilbert, Litchfield.
Johnson, Algot, Minneapolis.
Judd, Clarence, Morris.
Kimball, Arthur Hazon, Albee, S. Dak.
King, Clarence Everett, Washington.
Koch, Carrie, White Willow.
Laingen, Chester, Butternut.
Lane, Leon, Minneapolis.
Lawrence, Alva, Brooklyn Centre
Lawrence, William, Brooklyn Centre
Leinen, Mary, St, Paul.
Lemke, Ernest, St. Paul.
Lenhart, Edna Matilda, Minneapolis.
Lorenz, Sophie, St. Paul.
Lund, Henry Carl, Lansing.
McLaren, Harley Edward, Buffalo Lake.
Major, Herbert Edward, Jersey, Jersey Islands
Meloney, Linn Franklin, Minneapolis.
Monson, Bessie Pomme de Terre.
Mueller, Adolph, Mankato.
Nelson, Christene Pearl, St. Anthony Park.
Newton, William Daniels, Utica.
Oberg, Edgar Theodore, Watertown.
Oehler, Orlando, St. Paul.
Palmer, Mabel, Como, Wis.
Pennington, Alfred, Cottage Grove.
Peterson, Chase Oscar, Cottage Grove.
Peterson, Peter Godtfried, Hector.
Perkins, Ross Brankstom, Houston.
Redman, Earle Wayne, Omaha, Neb.
Robinson, Edward William, St. Paul.
Robinson, Evalena Maria, Minneapolis.
Roohr, Edna Margaret, Warwick.
Roohr, Frank Lewis Warwick.
Rowe, Minnie, Hewitt.
Sampson, Theodore Joshua, Strout.
Sandell, Lyle, New Brighton.
Sanderson, Theodore, Rockdell.
Schrader, Udo, Minneapolis.
Simon, Charles, Benson.
Smith, George Nelson, Minnetonka Mills.
Smith, Minnie Margeret, Minnetonka Mills.
Snyder, Leo Harter, Herkimer, N. Y.
Spilman, Peter, Elizabeth.
Strunk, Alice, Faribault.
Sweeney, Eugene, Garfield.
Swenson, Thea Pauline, Minneapolis.
Taplin, Frank Everets, Hancock.
Tingley, William, Stillwater.
Veldey, L. O., Hanley Falls.
Walther, Lucy, St. Paul.
Ward, Fred, Buffalo.
Washburn, Lura Mabel, St. Michael Station.

Wickstrom, Clara Lois, Oak Grove.
Wolner, Julius, St. Anthony Park.
Woodward, George Eugene, Langdon.
Young, William Ralph, Holloway.

PREPARATORY CLASS—95.

Aaker, Olaf, Kenyon.
Adams, Theodore, Luverne.
Anderson, Albert, Butternut.
Anderson, Anker, Big Swamp.
Anderson, Ben, Rowland.
Anderson, Emil Hendrick, Sacred Heart.
Anderson, Frank Oscar, Strout.
Anderson, Julius, Fairfax.
Armstrong, Charles Francis, Louriston.
Baker, Albert Ole, Kenyon.
Billingsley, Chester, Campbell.
Biederman, Hugo, Wells.
Bjertson, Bennie, Hanska.
Boss, David, Zumbro Falls.
Bracket, George, Long Isle.
Brudeli, Olaf, Madelia.
Busse, Maud, Station A, Minneapolis.
Busse, Harry, Station A. Minneapolis.
Christenson, Oscar William, Farmington.
Dahl, Albert, Harrison.
Dalbotten, Ida, Nansen.
Davenport, Ashley William, Western.
Davenport, Roy Jay, Western.
Deters, Louis Frederick, Eitzen.
Duff, William Don, Hampton.
Keller, Lizzie, St. Paul.
Laastnen. Martin, Elbow Lake.
Laate, Gurid, Radcliffe, Iowa.
Larson, Albert Gaphius, Bradford.
Larson, Alfred Gothard, Winthrop.
Leach, Ray, Excelsior.
Ley, John Edward, Smithfield.
Lind, Emma, Houston.
Lindem, Martin, Hoffman.
Livrud, Halvor, Belview.
Lockwood, Harry Jay, Grand Meadow.
Ludtke, Henry Adolph, Willow Creek.
Mahla, Huning Rudolph, Evansville.
MacComber, George Embert, Barnum.
Mather, Walter, Faribault.
Melhus, Martin, Nansen.
Monson, Willie, Pomme de Terre.
Naegeli, Herman Gustav, Elizabeth.
Ness, Mary, Providence.
Nugent, Michael Joseph, Hegbert.
Nugent, Patrick James, Hegbert.
Nugent, Michael Francis, Hegbert.
Peterson, Fred Olaf, Minneapolis.
Edberg, Jennie Victoria, Rush City.
Embertson, Oscar Frederick, Green.
Enestvedt, Engebert German, Belview.
Ferch, Lizzie, Odessa.
Ferch, Lydia. Odessa.
Ferch, Susie, Odessa.
Fingerson, Gilbert Jorgen, Swift.
Forstrom, Edward, Christiana.
Fox, Joseph John. Minneapolis.
Frandsen, Nels, Minneapolis.
Frederich, Maximilion, New Ulm.
Grafe. Roy, Hancock.
Hall, Ethel, Buffalo Lake.
Hall, Lester Lewis, Morris.
Hallickson, Emil, Ostrander.
Haggerty, Arthur, Hammond.
Hawley, Jennye, Faribault.
Held, Natalie Margarette, Minneapolis.
Heinze, Roselia Hulda, Kellogg.
Herbrandson, H. O Brooten.
Hermes, Clara, St. Paul.
Holmquist, Alice Wilhelmina. Dawson.
Hosford, Charles Edward, Nashua.
Hosford, John Benjamin, Nashua.
Keller, Hattie, Dundas.
Peterson, Maud Christine, Minneapolis.
Peterson, Thora, St. Anthony Park.
Price, Arthur, Beaver Creek.
Quale, Ove, Swift.
Quist, George Leonard, New Sweden.
Roberts, Henry Leslie, Cottage Grove.
Rudolph, Amy, Annandale.
Schumacher, Clara, St. Anthony Park.
Sheldon, Horace Fuller, Paynesville.
Sheldon, Merton Luther, Paynesville.
Seltz, William, Waconia.
Smith, George Alix, Cottonwood.
Stanley, Henry Martin, Maine Prairie.
Sletten, Hans Magnus, Willmar.
Swenson, Halvor, Lamberton.
Thompson, Eddie. Christiana.
Thoreson, Julia, Neby.
Torbenson, Oscar, Christiana.
Voxland, Clara, Norway.
White, Allen, Twin Lakes.
White, Ferris. Twin Lakes.
Wickstrom, Fred, Oak Grove.

SPECIAL 39.

Abraham, Alex, Houston.
Anderson, Martinus, Cottonwood.
Andreason, Dinal, Tuen.
Annexstad, Jens, Norseland.
Benson, Elmore, Houston.
Blake, Mrs. Jennie Minnie, Minneapolis.
Brown, Alex Hjolmer, Hallock.
Burkness, Nels Willmar.
Burtman, Elmer Otenus, Lester Prairie.
Carlson, Archibald, Vasa.
Christenson, Julius Thorwald, Elbow Lake.
Dokken, Albert Oliver, Swift.
Engel, George Adolph, New Prague.
Fjelstad, Theodore, Minneapolis.
Frederickson, Frederick Olson, Wilder.
Gray, Mrs. Jennie May, Minneapolis.
Hellickson. Anton, Ostrander.
Johnson, Charles John, Sacred Heart.
Kiichli, Joseph Henry, Minneapolis.
Kjos, Martin, Arendahl.
Lockwood, Jay, Grand Meadow.
Marston, Ole, St. James.
Mattson, George Allen, Red Wing.
Moen, Peter Alexander, Litchfield.
Nelson, Herman Benneth, White Rock.
Nelson, Norman, Montevideo.
Ormbreck, Alick, St. James.
Pederson, Nels Chester, Tyler.
Peterson, Hattie Louise, Minneapolis.
Pikop, Knute, Elbow Lake.
Renquist, Theodore Emil, Cannon Falls.
Schreffer, John, St. Paul.
Staples, Gertrude, St. Paul.
Svensgaard, Sverre, Elizabeth.
Swaren, Alfred Andrew, Alexandria.
Tinnes, Louis Alfred, Bird Island.
Thimijon, Bernard, Lake City.
Wheeler, Mrs. Edna Susie St. Paul.
Wilson, Henry, Hazel Run.

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